

VISUAL COMFORT AND COMPANY TEST REPORT

SCOPE OF WORK

LED Performance Testing

MODEL NUMBER

700BCLYK24S-LED930

PROJECT NUMBER

G104941221

REPORT NUMBER

104941221CRT-017

ISSUE DATE

10/19/2022

REVISED DATE

None

TEST DATES

10/07/2022 through 10/18/2022

DOCUMENT CONTROL NUMBER

RTTDS-R-AMER-Test-3407

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REPORT NUMBER

104941221CRT-017

MODEL NUMBER(s)

700BCLYK24S-LED930

REPORT RENDERED TO:

VISUAL COMFORT AND COMPANY
7400 LINDER AVE
SKOKIE, IL 60077

STATEMENT OF LIMITATION

NVLAP Lab Code 100402-0. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-01236637-1.

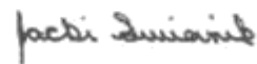
TEST STANDARDS

ANSI/IES LM-79-19: Optical and Electrical Measurements of Solid State Lighting Products

ANSI NEMA ANSLG C78.377: 2017: Specifications for the Chromaticity of Solid State Lighting (SSL) Products

In Charge of Testing:

Reviewer:



Melanie Brittain
Senior Associate Engineer
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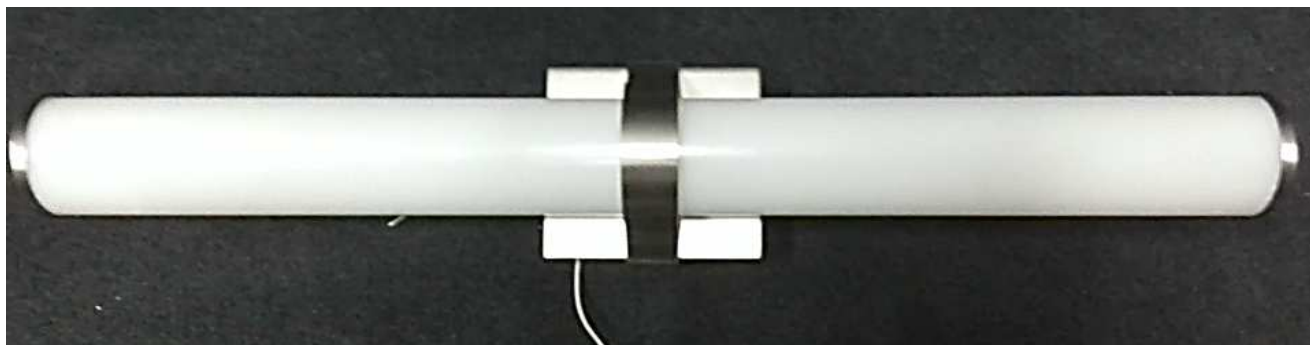
SAMPLE INFORMATION

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ITEMS RECEIVED

Item No.	Control No.	Model No.	Description	Type	Received
1	CRT2210051636-001	700BCLYK24S-LED930	Lynk 24 Bath	Production	10/5/2022

SAMPLE PHOTOS - TESTED CONFIGURATIONS



SUMMARY

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PRODUCT INFORMATION AND SUMMARY OF DATA

Product Model No.:	700BCLYK24S-LED930
Product Description:	Lynk 24 Bath
LED Model No.:	Everlight62-217D/HK2C-3H3030PBR22835Z15/2T/EU
Driver Model No.:	LTF DA22W600C2036BF1-00HE
Light Source:	LED

Criteria	Results	
	Goniophotometer	Integrating Sphere
Light Output (lumens)	1963.2	1953.8
Input Power (W) @ 120 (Vac)	21.94	22.04
Luminous Efficacy (lm/W)	89.50	88.65
Input Power Factor (I) @ 120 (Vac)	0.987	0.985

Criteria	Results
Input ATHD (%) @ 120 (Vac)	7.65
Correlated Color Temperature (K)	3002
Color Rendering Index - Ra (I)	92.1
Color Rendering Index - R9 (I)	54.9
Duv (I)	0.0015
Chromaticity Coordinate (x)	0.439
Chromaticity Coordinate (y)	0.409
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.523

TEST METHODS

SEASONING IN SAMPLE ORIENTATION - LED PRODUCTS

No seasoning was performed in accordance with ANSI/IES LM-79-19

INTEGRATING SPHERE TESTING

A spectroradiometer and integrating sphere were used to measure the spectral power distribution for photometric and colorimetric data of the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ and 10-65% respectively at a position inside of the sphere within 1.5m and at equal height of the EUT. Stabilization procedures to LM-79-19 were followed. The EUT was mounted in a 4π configuration.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

A Type C Mirror Goniophotometer system was used to measure the luminous intensity (candela) at each angle of distribution for the EUT. Electrical measurements of the unit were measured using a power analyzer. Each EUT was operated at the rated input voltage of the system in its designated orientation. The ambient temperature and relative humidity was measured at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ and 10-65% respectively at a position within 1.5m and at equal height of the EUT. Stabilization procedures to LM-79-19 were followed. The test distance was $\geq 5x$ the longest luminous dimension of the EUT.

TYPE C GONIOPHOTOMETER DISTRIBUTION TESTING

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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS

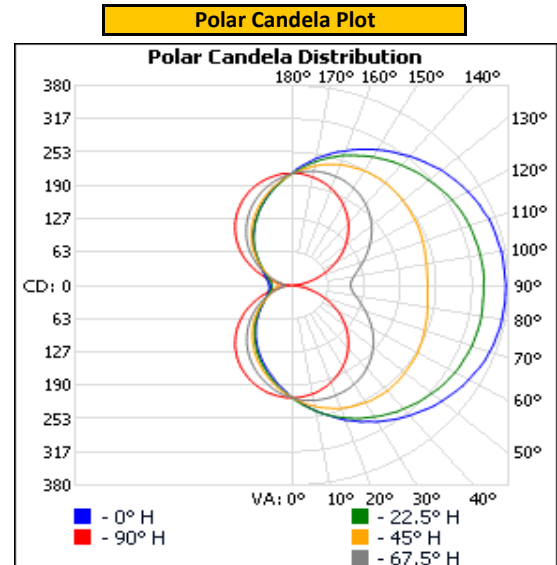
Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor ()
Wall Mount	119.99	185.2	21.94	0.987

Light Output (lm)	Efficacy (lm/W)
1963.2	89.5

LUMINOUS INTENSITY SUMMARY (candela)

Angle (°)	0	22.5	45	67.5	90
0	213	213	213	213	213
5	226	228	224	219	213
10	242	243	233	222	209
15	257	256	241	223	204
20	272	268	249	223	197
25	286	279	254	221	189
30	299	289	257	217	179
35	311	298	260	212	167
40	323	306	261	205	154
45	333	314	260	196	140
50	343	320	258	186	124
55	351	326	257	175	108
60	358	331	255	162	90
65	365	333	252	149	72
70	369	336	248	137	54
75	372	337	245	124	37
80	374	338	242	114	20
85	375	336	239	106	8
90	376	336	238	103	2
95	374	337	238	105	7
100	374	336	240	112	20
105	371	333	242	122	36
110	369	332	245	133	54
115	363	329	247	146	72
120	357	325	250	159	91
125	350	319	252	171	108
130	342	312	254	182	124
135	331	306	254	192	140
140	321	299	255	202	154
145	310	291	254	209	168
150	298	283	252	215	179
155	286	272	248	219	189
160	272	263	244	221	198
165	259	251	238	222	204
170	245	239	231	221	209
175	230	225	222	217	213
180	213	213	213	213	213

Entire luminous intensity matrix found in .IES file



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ORIENTATION AND ALIGNMENT OF EUT

Luminous Opening		
Length (ft)	Width (ft)	Height (ft)
0.19	1.96	0.22
0°-180° H	90°-270° H	0°-180° V

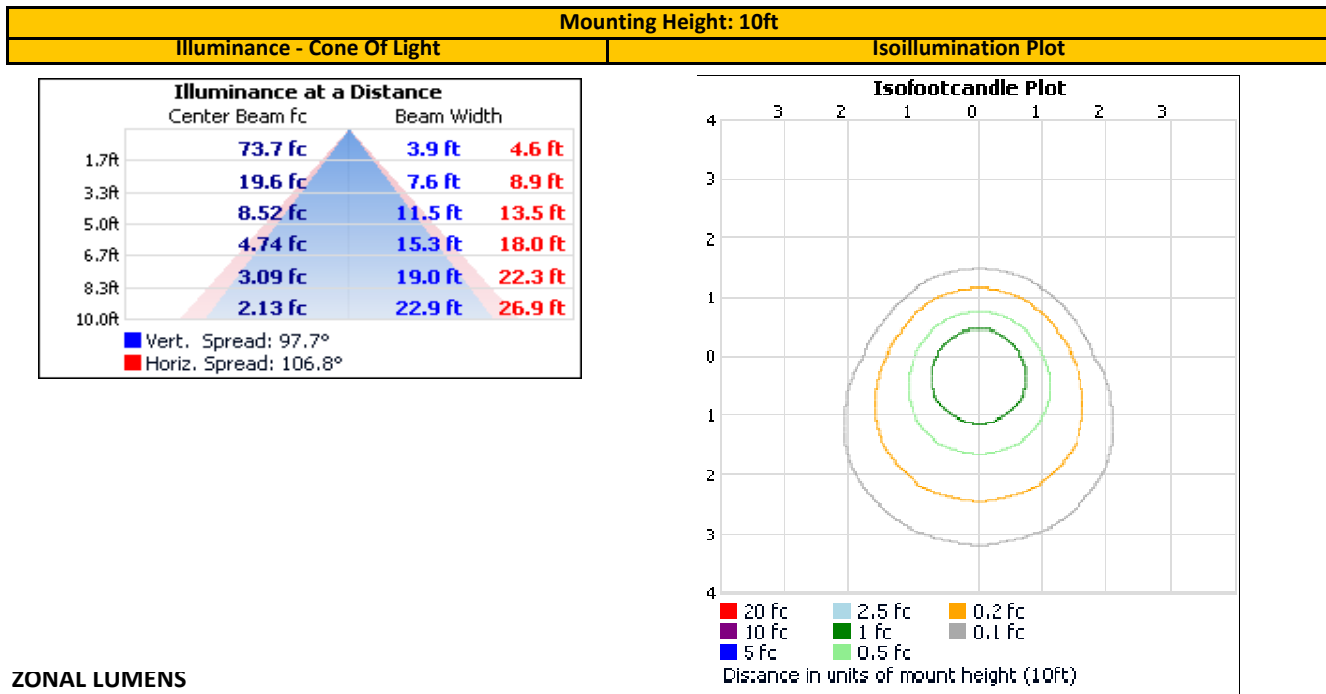
Test Distance (ft)
29.6

PHOTOMETRIC CENTER OF EUT



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ILLUMINANCE SUMMARY



ZONAL LUMENS

Zonal Lumen Summary					
Zone	Lumens	Luminaire	Zone	Lumens	Total
0-30	172.1	8.8%	90-100	132.5	6.8%
0-40	291.2	14.8%	100-110	137.5	7.0%
0-60	570.1	29.0%	110-120	142.3	7.2%
60-90	413.4	21.1%	120-130	142.1	7.2%
70-100	403.1	20.5%	130-140	135.0	6.9%
90-120	412.3	21.0%	140-150	118.5	6.0%
0-90	983.5	50.1%	150-160	92.6	4.7%
90-180	979.8	49.9%	160-170	59.0	3.0%
0-180	1,963.2	100.0%	170-180	20.2	1.0%

INTEGRATING SPHERE TESTING

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PHOTOMETRIC, RADIOMETRIC, COLORIMETRIC, AND ELECTRICAL MEASUREMENTS

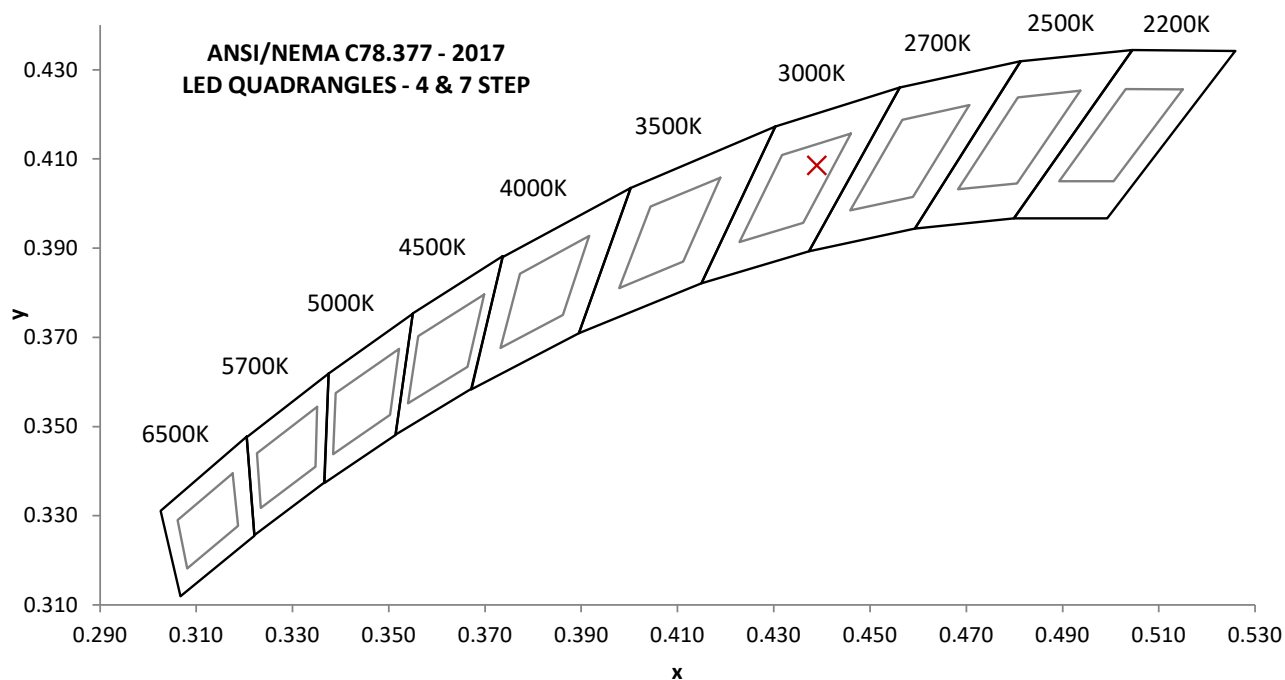
Base Orientation
Wall Mount

Input Voltage (Vac)	Input Current (mA)	Input Power (W)	Input Power Factor (l)	Input ATHD (%)
120.02	186.4	22.04	0.985	7.65

Measured at 120.02(Vac)

Light Output (lm)	Efficacy (lm/W)	CCT (K)	CRI - Ra (l)	CRI - R9 (l)
1953.8	88.6	3002	92.1	54.9

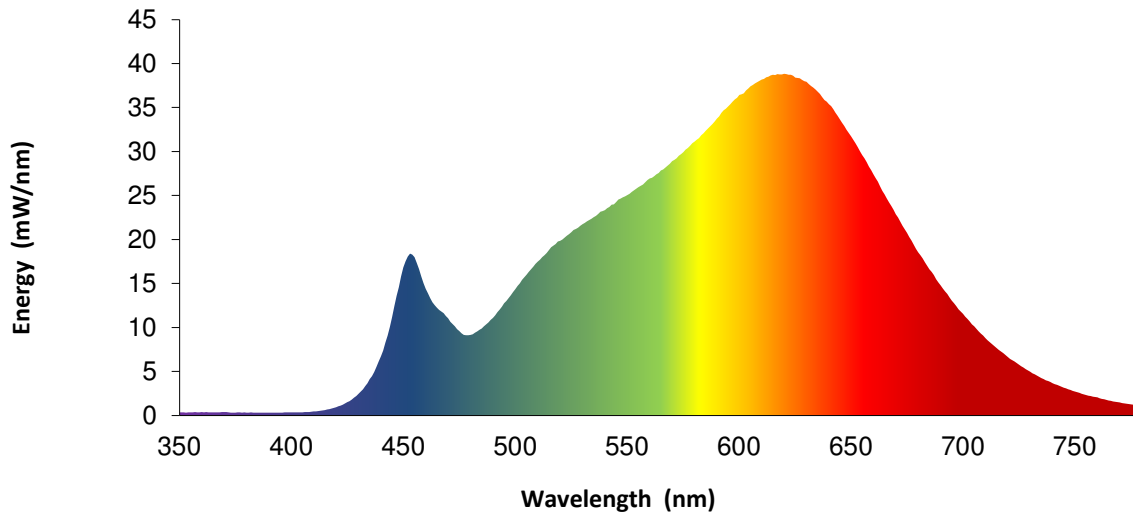
Duv (l)	1931 Chrom (x)	1931 Chrom (y)	1976 Chrom (u')	1976 Chrom (v')
0.0015	0.439	0.409	0.250	0.523



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SPECTRAL POWER DISTRIBUTION

nm	mW/nm		nm	mW/nm		nm	mW/nm		nm	mW/nm
350	0.3		460	14.4		570	28.9		680	18.6
355	0.3		465	12.2		575	29.9		685	16.6
360	0.4		470	11.1		580	31.1		690	14.8
365	0.4		475	9.6		585	32.4		695	13.1
370	0.4		480	9.1		590	33.7		700	11.5
375	0.3		485	9.9		595	35.1		705	10.1
380	0.3		490	11.1		600	36.4		710	8.8
385	0.3		495	12.7		605	37.4		715	7.7
390	0.3		500	14.4		610	38.2		720	6.7
395	0.3		505	16.0		615	38.7		725	5.8
400	0.4		510	17.5		620	38.8		730	5.0
405	0.4		515	18.8		625	38.4		735	4.3
410	0.4		520	19.9		630	37.9		740	3.7
415	0.6		525	20.8		635	36.8		745	3.2
420	1.0		530	21.7		640	35.4		750	2.7
425	1.5		535	22.5		645	33.7		755	2.3
430	2.5		540	23.4		650	31.7		760	2.1
435	4.1		545	24.2		655	29.6		765	1.7
440	6.7		550	25.0		660	27.4		770	1.5
445	11.2		555	26.0		665	25.1		775	1.3
450	16.8		560	26.9		670	22.9		780	1.1
455	18.0		565	27.8		675	20.7		---	---



Portrayed color in graphic is estimated by wavelength (nm) and may not be exact - it is a visual representation only

EQUIPMENT LIST

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#	Equipment	Model No	Control No.	Last Cal	Cal Due
1	Elgar AC Power Supply	CW1251	---	VBU	VBU
2	Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
3	Traceable Hygrothermometer	200110913	L206	2/21/2022	2/21/2023
4	Yokogawa Power Analyzer	WT1600	E462	5/21/2022	5/21/2023
5	Fluke Thermometer	53 II	D588	6/13/2022	6/13/2023
6	Current Monitor	411	A197	8/26/2021	8/26/2024
7	3M Integrating Sphere Spectrometer System	CDS 2600	L231	9/13/2022	12/13/2022
8	LSI High Speed Mirror Goniophotometer	6440	---	10/7/2022	1/7/2022
9	Elgar AC Power Supply	CW1251	---	VBU	VBU
10	Yokogawa Power Analyzer	WT210	307-E464	6/21/2022	6/21/2023
11	Traceable Hygrothermometer	4800	L204	2/21/2022	2/21/2023
12	Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
13	Omega Thermometer	DPi8-C24	M263	3/1/2022	3/1/2023
14	Bosch Distance Laser	Pro GLM 20	L210	3/21/2022	3/15/2023
15	Tape Measure	Crescent	---	9/21/2021	9/21/2024

The AC power supplies used for testing have a crest factor capable of 0-3.5

REVISION HISTORY

#	Revision Date	Updated By	Reviewed By	Description of Change
---	None	---	---	---
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ANNEX A - TM-30 CALCULATIONS

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TM-30 REPORT

